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THE CAHOKIA MOUNDS—A SUGGESTION.

To those who accept as satisfactorily proven the theory that the Indians were the builders of the mounds in the valley of the Mississippi, the next step in the investigation would seem to be the study of local works, or works of particular sections, with reference to the probable authors. The problem, however, is an exceedingly difficult one, and at present seemingly beyond the hope of solution. However, it will continue to be attacked until the limit of possible determination has been reached. As the Cahokia mounds are in some respects peculiar, I suggest to those who hold to the Indian theory, some of the probable limitations to the inquiry as to the authors.

The great mound of the group is recognized as of a type belonging almost exclusively to the more southern section, and is apparently most closely allied, in form and size, to a type found in eastern Arkansas. It and the group to which it belongs seem out of place in the situation where they are found, and appear to hold the key to some of the problems relating to the prehistoric times of southern Illinois, southeastern Missouri, and possibly of middle Tennessee.

Assuming that the group was built by Indians, let us see who or what tribes may be excluded, and to what tribes we may possibly ascribe their origin. Omitting the southern tribes for the present, it may be safely assumed that the builders could not have belonged to any of the northern stocks except the Algonquian or Siouan. Of the former stock the inquiry may be limited to the Shawnee and the group of tribes known as Illinois Indians (Cahokia, Tamaroa, etc.) We may still further limit by excluding the Kaskaskia, who did not leave their northern habitat until about the year 1700. The Peorias may also be excluded, as they were never, so far as known, in southern Illinois. This leaves, of the Illinois group, only the Cahokia, Tamaroa, and Mitchigamia. As Father Gravier visited the Tamaroa and Cahokia in 1700, then in the immediate vicinity of the mounds, and states that one of the missionaries labored among them during that winter, and yet makes no mention of the mounds, it is probable that they were then covered with forest growth. At any rate it is presumable they were not then occupied by these tribes, as would probably have been the case had they been the builders.

The small size of the Mitchigamia tribe would seem to exclude them. That they may have been far more numerous at some previous date is possible, but our reasoning must be based on the data within our reach. Finally, it may be stated in regard to the tribes of the Illinois group, that there are reasons for believing they were comparatively recent comers into this section.

As to the Shawnee, it may be stated that we could assume they were the builders only on the supposition that they had been in southern Illinois long before their appearance in that region in the historic era. As there are very strong reasons drawn from the mounds for believing they were in this section

in prehistoric times, and that they were mound-builders, it brings them within the list of the possible authors.

Of the Siouan tribes we may perhaps at once exclude from the discussion all save the group named by Mr. Dorsey, the Dhegiha (Omaha, Osage, Kansa and Kwapa), and the Biloxi. The tradition of the former residence of the Akansa (which certainly includes the Kwapa) on the Wabash, which, by the early writers giving the tradition, included not only that river, but also the Ohio from the junction of the Wabash to its mouth, has been generally accepted by leading authorities as true. Whether the other closely-allied tribes were included under the designation Akansa is somewhat uncertain, though it is accepted by some of the most competent authorities. At any rate, we are justified in accepting as true the belief that the group, previous to division, was at some time in the past east of the Mississippi, north of the mouth of the Ohio and west of the Wabash.

As the Kwapa were found by De Soto in eastern Arkansas, and were probably builders of some of the large pyramidal mounds of that section, especially the terraced ones like that at Cahokia, and like that in Indiana near the Wabash, where probably they formerly lived, it is possible they were builders of the Cahokia mounds. Among the possible authors we must, of course, include the mound-building tribes of the southern portion of the immediate Mississippi Valley.

It will be seen, assuming the builders were Indians, that the investigation may be very materially limited in the manner suggested. It may be asserted as possible that the tribe by whom they were erected has long since become extinct. It is true this is a possibility and must remain so; nevertheless, without some reason being shown for this assumption, our conclusion should be based on the more evident data.

We cannot here enter into a discussion of the movements of tribes in that region in prehistoric times. If the general direction was southward, the group may have been built by some one of the Southern tribes while on its way thither; but what would seem to be more likely, unless attributed to the Kwapa, is that it was built by some Southern tribe which had pushed its way back northward. This suggestion, of course, is based upon the idea that the construction of these large terraced pyramidal mounds originated in the Southern region.

The above has been written merely as suggestive of the possible limitations in the discussion of the authorship of the mounds of particular districts, on the assumption that the builders were Indians.

If I am not mistaken, Dr. Snyder, the editor of The Archaeologist, has in his possession the notes and plats of Dr. Patrick, who devoted much attention to the study of this important group. If I am correct in this, he might cull from them much that would be interesting to the readers of The Archaeologist. I was shown, by Dr. Patrick, part of the covering over the skeleton unearthed from a mound formerly on the site of East St. Louis. This was hardened earth, literally covered with minute sea shells in absolute contact, so as to leave no uncovered space. This, he informed me, was but a fragment of the covering over the entire skeleton. I mention this as it indicates communication of the mound-builders of this region with the Gulf coast, or an extension northward of Southern tribes.

CYRUS THOMAS.

Frederick, Md.

CIST BURIALS IN MISSOURI.

The immigration of the Stone Grave race of Indians can be followed in Missouri from the point south of Cape Girardeau, where the highlands bordering the Mississippi river merge into the swamp region, north to the mouth of the Missouri river, and thence along this stream for some distance.

The ridges along the tributaries of the Mississippi, in Missouri, also bear witness of the wanderings of these people by mounds containing stone cists and stone graves. It also seems to be a fact, borne out by the greater number of cist burials met with, that the west side of the Mississippi river contained a far greater number of these people than the east side of the river. The writer knows of but two stone grave cemeteries on the Illinois side; one near Cahokia and another at Harrisonville, thirty miles south.* On the Missouri side eight cemeteries have been visited and others have been located by hearsay; single graves, or groups of twos and threes, are continuously met with.

In Missouri occur also (and in the same localities) the stone cist burials in mounds as met with south of the Ohio river. The general characteristics of these cists in Missouri do not differ materially from those of other localities. On the high, dry and clayey bluffs bordering the rivers, the top stones are scarcely below the surface; in some instances the top stones lie exposed, while in the soft alluvial soils of the bottoms the excavations are of greater depth, often as much as three feet.

The writer is of the opinion that the amount of labor required in digging had much to do with the depth at which the bodies were placed. This latter would probably also account for the long graves, and the short graves at one time attributed to a "pigmy" race.

Full-length graves, in which the body had been placed flat with limbs extended, and short graves, which contained a doubled-up, or "bunched," burial, have been met with side by side.

As a rule, the full-length graves were excavated to a depth barely sufficient to contain the body, whereas the short graves were of greater depth to receive the remains in a squatting posture. The full-length burials were nearly always placed flat on the back, with lower limbs extended and arms at side. For the smaller graves the body was doubled up, the knees bent until the feet touched the thighs, and the trunk and limbs pressed together until the chest and knees met and the head bent forward. Thus the entire body was compressed into a space less than two feet square.

The writer has opened short graves from the side, and upon removing the infiltrated earth the method of filling the "pigmy" grave was explained. "Bone" burials can be accounted for in many instances by the decomposition of the remains and falling together of the skeleton occurring before the infiltration of earth had filled the cist.

These cists, in Missouri, in construction are not dissimilar to those described by other writers; flat, rough stones placed on edge formed the sides and ends, with similar stones lying flat formed the top. It was an exceptional case when the bottom of the tomb received a lining of slabs.

Rarely was it, in Missouri, that the utensils or arms of the deceased were placed in the cist; some crude water bottles and jars, an occasional urn or food dish is found, and these of the coarsest description, not comparing in forms, symmetry or finish with like vessels from southeast Missouri or Tennessee. Of

*** From the description of Illinois Cist burials, the locality visited by Major Hilder and Dr. Wislizenus is undoubtedly directly opposite St. Louis, east of Cahokia, but was not the cemetery visited by Mr. Flagg in the '30s, this site being some thirty miles south, near Harrisonville.**

stone implements, the writer has found rude flints, and in one instance, in opening a cist in the heart of St. Louis, a finely-formed and finished grooved stone axe six pounds in weight.

The burials occur in the near vicinity of the village sites of these people, usually where water was plenty, and more especially at mineral springs (which are abundant in Missouri).

Lithia springs, in Perry county; the salt springs at St. Genevieve, the sulphur springs at Kimmswick and Fenton, and the Cerre salt and sulphur springs on the Merrimac river, each had their village and burial sites.

It is on the village sites rather than in the burial places that the archaeologist in Missouri must search for the relics of the stone grave race, and the search is always rewarded by fine examples of their work in flint and other stones, pottery, etc. The following localities in Missouri will record places most familiar to the writer: The bluff on river, southeast corner of Perry county, six miles south of Claysville, mound built up of stone graves; bluff on Perryville road west of Claysville; cemetery near Lithia springs, Perry county; extensive cemetery on bluff south of St. Mary's, St. Genevieve county; scattering graves near the mouth of Salt river, St. Genevieve county; also on Plamen creek, near Herculaneum, Jefferson county; cemetery at sulphur springs and Kimmswick, Jefferson county;

On Big river, a picturesque, clear-water stream parallel with the Mississippi, and flowing north into the Merrimac about seventy-five miles above its confluence with the Merrimac, are mounds containing stone cists; thence to its mouth are other similar mounds and groups of stone graves. Some pretty pottery has been found in the cists on Big river.

On the Merrimac, from Big river to junction with the Mississippi (eighteen miles south of St. Louis), stone cists have been continuously met with, especially at Valley Park, Cerre Springs (pigmy graves), Fenton (ditto), and near the mouth (ditto). On the River des Peres several small groups occur.

St. Louis, on the river bank at the foot of Arsenal street, a cemetery, destroyed some years since in grading lands preparatory to improvement, material wasted in filling ponds and quarries.* Missouri river, south bank west to Washington, Franklin county, isolated graves and two cemeteries are known; one site near Becker, Franklin county, destroyed in grading railroad, considerable pottery and implements were discovered; on the river bluffs, near Labadie, small groups of cists, all destroyed.

These traces of a former race rapidly disappear as the forests are cleared and the agriculturist seeks consolation for broken plow-points and harness by grubbing up and tearing off, for building or filling purposes, these stone tombs, while their contents contribute to mellowing the soil.

Wm. J. Seever.
Secretary Missouri Historical Society.

St. Louis, Mo.

* In this site, after 1770, existed a village of Peoria Indians (testimony of Auguste Chouteau in 1825), and noted in "The History of the Grand Prairie Common Fields of St. Louis, by Henry V. Williams, St. Louis, 1864."

THE "SANDAL LAST" OF THE CLIFF-DWELLERS.

In the number of this magazine—then entitled The Antiquarian—published in the month of May, 1897, on pages 128 et seq., I called attention to those curious stone implements found in many of the cliff and cave dwellings of the Southwest, known, locally, as "Sandal Lasts"; and ventured an off-hand guess at the manner in which they were probably used by the Indians who made them. The attempt I then offered to explain their purpose was merely suggestive and was written in the spirit of inquiry, hoping that it would induce responses from persons who knew more about those strange objects than I did. In this expectation I have been disappointed until very recently.

As I stated in the paper referred to, the many specimens of this ancient household implement it has been my fortune to examine, all conform to the general shape represented by Fig. 1, varying in dimensions from eight to fourteen inches in length, from four to eight inches in width, and three-quarters of an inch in thickness. The most of them are of hard slate, but occasionally one is found cut out of some other kind of stone, and all are very smoothly finished and bear evidence of long-continued use. During the past summer I was kindly permitted by Mr. H. P. Hamilton, of Two Rivers, Wisconsin, to examine a collection of fine stone implements in his possession, found in the cliff houses of eastern Arizona by prowling Indians, and by them bartered to a local trader there, of whom Mr. Hamilton purchased them. Among the lot was one of the "lasts" in question, of the regulation pattern, twelve inches in length and finely polished. It was made of compact jet-black slate, which, however, had been purposely dyed, or painted; or by heat, or use in contact with coloring materials or liquids, had been changed in color to a light gray tint. And—by the way—many of the other implements from the cliff houses made of the same black slate-like stone, as celts, axes, hoes, etc., present the same curious discoloration, not met with in objects of slate found in other localities. This sandal last differed but little from others of the same class excepting in having engraved on one of its smooth sides a strange figure, represented in Fig. 2, drawn to a scale one-third of its actual size. This artistic etching was doubtless done by cutting through the outer coloring matter into the slate with sharply-pointed fragments of quartz or obsidian, leaving the lines glossy black in strong contrast with the whitish-gray surface. Whether or not this queer intaglio stone-drawing has any symbolic or emblematic significance; or is simply the idle scrawling of some listless, tawny sandal maker, may be determined by a Cushing, or a Fewkes, who is deeply versed in the mythology, religious rites and customs of the unknown occupants of the cliffs and caves.

In a note appended to a communication from Mr. Richard Wetherill, of Mancos, Colorado, on page 248 of The Antiquarian, I stated that I had, a short time before, seen "in the museum of the Missouri Historical Society, in St. Louis, one of these strange objects (sandal lasts) made of pottery ware or baked clay," in the same general form of those carved of stone, and having one of its surfaces "finely ornamented with intricate, scroll-like designs that had evidently been impressed with a die, or stamp, into the material when it was soft and plastic." This description was written after a slight and hurried examination of the odd object as I saw it in one of the museum cases. This unique specimen, with other Cliff-dwellers' relics, from the same locality, have, since then, passed into the possession of Mr. M. C. Long, of Kansas City, Missouri, where they may now be seen in the museum founded there by that gentleman, for the present situated in the Public Library building. On writing to Mr. Long for a drawing or photograph of the clay relic, he kindly sent it to me for inspection, together with one of polished black slate, well represented by Fig. 1, and an old, well-worn sandal

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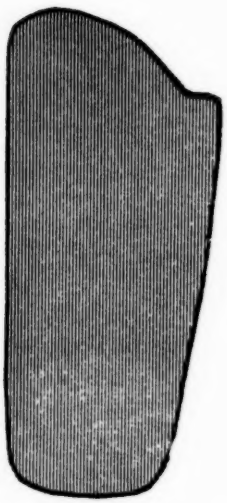


Fig. 1.

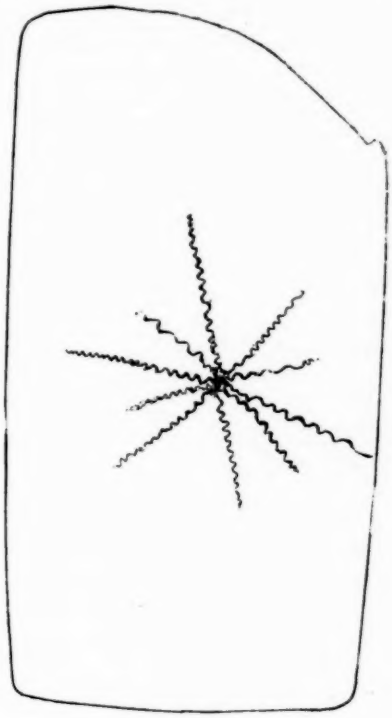


Fig. 2.

of woven vegetable fiber corresponding with them in outline, all three having been found, together with other articles of domestic use, in a cliff house in Butler Cañon, Utah.

On careful examination I found this terra cotta sandal last to be a remarkable specimen; though not altogether a Rosetta stone for the ready interpretation of the minutiæ of sandal-making. It was, however, intended for a printed record of one phase of the sandal manufacturing process; bearing—in this view—a striking analogy to the old tile and brick prints of Assyria. In composition it is a fine sandy clay, and was molded, when soft, on a flat, smooth stone, as is indicated by its plain, smooth under surface with sharp, square edges all around. Its upper surface was well finished, with the bordering edge evenly rounded and polished, after the best style of Pueblo pottery. It is just twelve inches in length, by six and a half inches in width in its broadest part, and is three-fourths of an inch thick. It was burned hard, but when found was broken into three pieces, which have been fairly well adjusted and fixed together with cement. Before the clay was subjected to the action of fire, and when plastic, it received upon its yielding surface an impression, the fourth of an inch in depth, of an intricate figure, for the preservation of which the clay object seems to have been designed. The fractures, with other rough usage it has evidently received, have considerably impaired the distinctness of the figure stamped in it; but the skill of a superior artist, Mrs. Alice Martin, of Virginia, Ills., has restored it perfectly, as seen in Fig. 3. A peculiarity of these zigzag lines stamped in the burnt clay, that for a time defied all attempts at explanation, was their corrugated appearance, similar

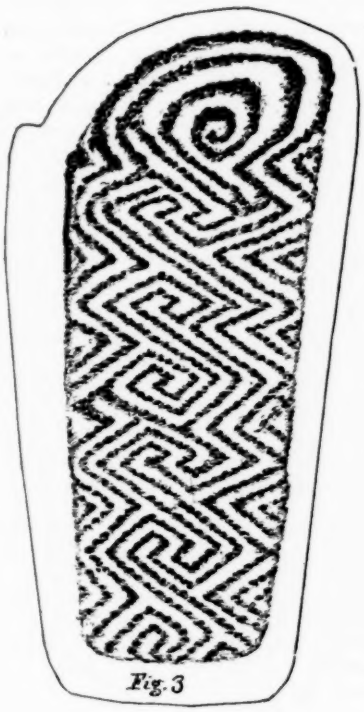


Fig. 3

Fig. 4

to that observed on many specimens of mound pottery, as though the stamp employed in impressing them had been made of twisted cords and was some form of textile fabric. And so it proved when found; and it was discovered ready at hand upon examination of the old, worn-out sandal, represented in Fig. 4. To those familiar with the many varieties and patterns of sandals recovered from the cave and cliff dwellings about the canyons and streams between Salt Lake City and El Paso, the puzzling indenture on the clay model may have been readily understood; but with the very limited number of specimens for study and comparison at my command, it would probably have remained to me an inscrutable enigma but for this dilapidated key that unlocked it. It unlocked the puzzle so far as to demonstrate that the mate to Fig. 4—for sandals of this class were made in "pairs," "rights" and "lefts,"—was the stamp which made its faithful impression on the soft clay; but the motive for preserving this stamped copy of the weaver's pattern on the terra-cotta model remains yet to be explained, without we accept the conclusion that the object was made for no other purpose than simply to preserve the figure as a guide for weaving others to correspond with it.

The tattered fabric represented by Fig. 4 is a marvel of skill and proficiency in the art of weaving that can scarcely be surpassed at the present day, excepting by the aid of machinery. The perfect regularity and symmetry of the lines and angles of the complex figure display not only trained and dexterous manipulation, but also esthetic culture of a high order. The material of which it is made seems to be wild hemp *(apocynum cannabinum)* spun in fine threads, woven in "two-ply,"

compactly and with undeviating regularity, making a firm mat nearly the quarter of an inch thick, plain and smooth on its upper surface—upon which the bottom of the foot rested—and with the angular figure, in bold relief, on its under, or adverse, side. The question of motive is here again presented. Was the object in weaving such an intricate and difficult design on the bottom of the sandal merely to roughen its surface in order to ensure safer footing to its wearer in clambering up the steep slopes to the human eyries built in the crevices of the lofty escarpments? Or, was there a subtle significance in the track made by these sandals when walking on the soft ground or in the dust?

In describing a Cliff-dweller's two-ply sandal, belonging to the collection of Mrs. T. T. Child, of Washington, Professor Otis T. Mason says: "The under side of this sandal also is worthy of study, for the weaver has tied single knots in her cord all around the under margin, and also at proper places under the heel and under the ball of the foot where the strain would come. This ingenious device stands for the hobnails in peasants' shoes of more advanced people." * It is not probable that this elaborate work, shown by Fig. 3, woven with so much pains and consummate skill on the bottom of a sandal, could be intended only to answer the purpose of hobnails. Nor can we believe that people possessing the esthetic sense and marvelous dexterity of the Cliff-dwellers would waste so much patient labor on the under side of a sandal merely as an embellishment.

Applying to Professor Frank Hamilton Cushing, of the U. S. Ethnological Bureau, whose long and intimate acquaintance with the present Pueblo Indians has revealed to him much of their inner life and hereditary history, for information regarding the polished stones known as sandal lasts, and also for his opinion of the figured sandals, he very courteously replied as follows: "The flat, sole-shaped objects from the cliff-dwellings, usually characterized by a slight notch at the shorter side and wider end, highly polished, and of striated black slate, or highly polished yellow-gray argillite, were sandal forms; if the result of comparative study and of experiment may be taken as evidence. To the Zuni descendants of the Cliff-dwellers their significance was rather fetichistic than utilitarian. They were regarded as, in a sense, shields of the warrior's trail. But this in itself goes a long way toward establishing their use. For, according to my experiments with an actual specimen which was found accompanied by an unfinished yucca-strip sandal, they were used principally in the plaiting of the figured sandals. Indeed, these latter could not be made without a sitting-up-and-stretching form, and basket bodkins, whilst the plainer and looser sandals could be made with the hands and bodkins alone. Now, the figures on the sandals were symbolic according to their details of cosmical agencies of protection—the commonest figure being that of the arrow diagram of the four quarters; or one of the four quarters. Since these figures were fashioned in a kind of over-ply stitch, they were impressed on the soil in each footprint, assuring 'safe direction' to the wearer.

"A somewhat similar sandal form was in use among the Mexican Indians; but it was made of wood, usually hard and very close grained, and this explains why the Cliff-dweller forms were made of stone. For in the Mexican examples the wood was chosen with reference to keeping the yucca strands moist when not being plied; whilst the cliff examples evidently had to be made of stone because of the absence or scarcity of non-warping and non-checking varieties of wood. It is noteworthy, however, that finely-laminated stone, or supposedly fossilized wood, was chosen to replace, presumably, an older kind of the last form.

* Primitive Travel and Transportation, by O. T. Mason. Report of the U. S. National Museum for the year ending June 30th, 1894. Page 359.

This is but a hasty and meagre account in reply to your question, yet I hope it will suffice for your immediate purpose, as I am now unable to write more fully on the subject."

In this communication Professor Cushing sets at rest all conjectures about the use to which the sandal lasts were applied, and he also explains the superstitious motive of the figured sandals. There remains yet to be learned the exact modus operandi of sandal-weaving requiring the employment of the stone last, and just how it was employed. Until further light is shed upon this point, the hypothesis I advanced to explain it, in my Antiquarian paper referred to may be accepted as, at least, plausible. My guess then was that the fiber strands were passed around the stone at stated intervals, and upon these as a foundation the weaving proceeded on both sides of it alternately, following the same stitch design in both; so that when finished, dried and cut apart the sandals were the counterpart of each other excepting that the toe curves were reversed, constituting them "rights and lefts." In this process the inference is plain that the impressed figure on the terra-cotta form was intended for a fixed pattern to guide the weaver in plying her bone needle or bodkin.

J. F. SNYDER, M. D.

Virginia, Ills.

PREHISTORIC MUSICAL INSTRUMENTS.

By Thomas Wilson, U. S. National Museum, Washington, D. C.

It has been asserted that the origin of vocal music was coeval with that of language, and that the construction of musical instruments dates with the earliest inventions suggested by human ingenuity. Those who make these assertions do so simply upon theory, and when pressed for their authority would be compelled to admit that actual knowledge or information upon the subject does not exist. What can be affirmed is that sound made by the prehistoric man of the earliest epoch might have been rhythmic and so possessed one of the elements of music. The other elements—melody, dynamics and harmony—followed in the course of civilization, among some people at a faster and among others at a slower rate. Vocal sounds are incapable in themselves of perpetuation. When the vibrations made by the human voice have ceased, the incident is closed and the evidence lost. It is, therefore, in the absence of any written testimony, impossible to identify the practice, or even the existence, of vocal music in prehistoric times. We are driven to an exclusive consideration of musical instruments, and if these should fail us, we would be without evidence.

It is the intention, in the paper of which this is an abstract, to leave aside all speculation as to the origin, theory, practice, philosophy and poetry of music, and to deal only with music as one of the fine arts of prehistoric times; the study thereof to be based upon such knowledge as is obtainable from prehistoric musical instruments.*

Musical instruments of percussion are the most simple, in the sound or the effect produced, and the theory has been accordingly announced that they were the first to have been invented, that is, they were the earliest factors in human musical culture, and the first to be used among primitive peoples. The next in order of

* Volume written by Thomas Wilson and E. P. Upham, published by U. S. National Museum, Report for 1898, pp152, pls. 4, figs. 259.

complexity, and accordingly second in order of invention and evolution, were wind instruments. Rowbotham (History of Music, Book I) divides them into types, of which his representatives are the drum, the pipe and the lyre. Under the first head fall rattles, gongs, triangles, tam-tams, castanets, tambourines, cymbals, all instruments of percussion; under the second head fall flageolets, flutes, hautboys, clarionets, bassoons, bugles, all wind instruments. All stringed instruments fall under the third head. He makes these types representatives of three distinct stages of development, through which, in the order named, he says, all prehistoric music has passed. "As in the geologic history of the globe the chalk is never found below the oolite, nor the oolite below the coal, so in the musical history of mankind is the lyre stage never found to precede the pipe stage nor the pipe stage to precede the drum stage. In keeping with this is the fact that the savages sometimes had the drum alone, but never the pipe alone or the lyre alone, for if they have the pipe they have the drum too, and if they have the lyre they always have both the pipe and the drum."

Wallaschek wrote (Primitive Music: Its Origin and Development, with Songs, Instruments, and Pantomimes of Savage Races) after Rowbotham, and assailed strongly the latter's theory of threefold development of aboriginal musical instruments. He denied the drum to have been the earliest or first invented, and asserted, that which is demonstrated in this paper, that in many cases wind instruments (whistles, flageolets and horns) antedated drums. He reversed Rowbotham's order of simplicity and argued that the lyre or harp of Africa, formed as it might have been from a bent twig or the two branches of a tree with a string stretched taut between the ends, were not only more primitive and easier and quicker made, but, as confessed by Rowbotham in his appendix, it was in fact invented and in use among the most degraded savages of the country, that it spread over a large portion of the continent of Africa before the pipe or drum, and was in use among many other tribes in connection with pipes, but without drums.

The authors are aware of the mass of literature on the science and practice of music, how historians and discoverers of primitive or savage peoples have reported, in many volumes, the music they have heard and the instruments with which it was made. These have not been followed, nor any of their theories adopted, and the sociologic or scientific sides of music among primitive or ancient peoples have been avoided. They have contented themselves with a description of prehistoric instruments and such notes or tones as could be produced by their manipulation.

Lartet and Christy found prehistoric whistles in the cavern of Laugerie Basse, in the Dordogne District, France. They also found whistles of the same kind in the cavern of Aurignac. It was supposed that both these caverns belonged to the Paleolithic period, and, therefore, they afforded corroborating evidence of the use of these instruments in that period. Later investigations rendered this certain with regard to Laugerie Basse, but made it uncertain with regard to Aurignac. When the first whistle was found, in 1860, in Aurignac, it was reserved by these gentlemen for this confirmation, but afterwards, when, as they say, there had been many discoveries of this kind of instrument, notably those from Laugerie Basse, so that specimens are not now rare in museums and collections, they felt themselves justified in assuming the existence and use of this instrument in Paleolithic times.

Marquis de Nadaillac (Moeurs et Monuments des Peuples Prehistoriques, pp. 92-3, No. 30) figures a whistle of deer horn or reindeer phalange from the collection of Massenat (Brives, France), and states that others have been found in the caverns of Les Eyzies, Schussenried and Chaffaud. He continues that they have been found in the Belgian caverns, in the peat beds of Skane, southern

Sweden, in the Island of Palmaria, and at other points. He says that there have been found, in the Grotte des Cottes, the radii (canon) of the reindeer and auroch treated in the same manner, and which might have been destined for the same purpose. He tells of Longperier's mention of a human bone pierced with holes at regular intervals, serving, by a strange irony of death, as a flute with which to charm the living; also of Judge Piette, who, in one of his numerous excavations, discovered a flute made of two bird bones which, joined, would make modulated tones. Similar bones were found in the collection at Rochbertier. Beyond these he knows of none. The whistle, he thinks, may have been used in war or in the chase, but he expresses no opinion as to the probable use of the flutes. The chief value of his report is in finding the instruments. This done, with their respective strata and associated implements, they speak for themselves, and the inspector or examiner is as well qualified to determine their function as is their finder. His qualification is to be determined by his experience with other or similar finds, and his ability to compare them with other instruments. It is to be remarked that, while the first series mentioned above by Marquis de Nadaillac are from caverns mostly of possibly Paleolithic, the remainder are probably Neolithic, though this would require closer examination and greater knowledge of the locality and strata of their origin than is now possessed by the author.

Furfooz is one of a number of prehistoric stations, many of which are Paleolithic, near Namur and Dinant, on the head waters of the river Meuse. In this station have been found, in what stratum I am unable to say, nor even do I know positively in what cavern, but quoted from the Annals of the Société Archaeologique of Namur (Vol. XIX; 1892, p. 366), as having been found "dans les bains voisins de la forteresse," a whistle of white clay (en terre blanche) in the form of a bird, the mouthpiece of which was in the tail and the venthole in the belly. Another whistle, said to have been found in the phosphate beds at Mesvin near Mons, Belgium, and claimed to have been Paleolithic, is in the possession of M. Leon Somzée, of Brussels.

The question will immediately arise whether these were really musical instruments. It has been suggested that they were calls or signals, and may have been used, as the boatswain does his whistle to direct the movement of men at a distance. This would not be music, and if they were always thus used they would not be musical instruments; but if on the other hand, they were used to give rhythmical cadence to a dance or song, or for any similar purpose, they would be musical instruments. Any attempt to decide to which use these objects were put and so decide whether they were or were not musical instruments would be mere speculation. That they might have been used as such, and that hundreds of other similar instruments have been found which were used as musical instruments, justifies this classification and their insertion in this paper.

M. Fetis (Histoire Generale de la Musique) gives an illustration of a pipe from a prehistoric grave of the Neolithic period near Poitiers, and of which a cast was furnished by M. Lartet. It was rudely constructed from a stag horn, was blown at the end like a flageolet, and had three finger holes equi distant.

The most elaborate, as well as the most beautiful instruments of music belonging to prehistoric times, were the bronze and gold trumpets or horns of Scandinavia. They are not toys, but are of large size, quite as large as any horns of modern times, being sometimes five and even up to eight feet in length, with bell mouths six, eight and ten inches in diameter. No particular style was adopted, though all specimens agree in the requisites of the horn or trumpet.

A notice of a concert of the instruments in the Copenhagen Museum was published in the Evening Star, February 6, 1896, from the San Francisco Chronicle, which is here inserted:

"An enormous crowd fills the museum and the neighboring square at Copenhagen every midsummer day to listen to a unique concert. A number of ancient Scandinavian horns more than three hundred years old, called 'luren,' are kept in the museum. Of this collection fourteen are in good condition. They have an elegant shape, and the flat metal plates at the mouthpiece show good technical perfection and a developed taste for art. They are of different pieces fitted together. They are of very thin metal and generally seven feet long. A few years ago it was found out by Dr. Hammerich that they could still be blown or played upon. Their tones resemble those of the tenor horn, and they have a soft but powerful sound. Some are tuned in C and E sharp and others in D, E, or G, and these tunes form an accord, but no 'scala.' On the balcony in the court of the palace in which is kept the Northern Museum two members of the 'capella' blow tunes on two of these primeval horns to the delight of the inhabitants."

Professor Starr says one of one of these concerts:

"We had the good fortune to be present. The court of the museum was filled with hearers. Wonderful, is it not, that horns two thousand years old, buried for long centuries in peat bogs, should, after this long silence, still be capable of giving out clear, ringing, even sweet tones."

The ancient musical instruments of Ireland, so far brought to the notice of archaeologists, are the horn or trumpet, the harp, and the bagpipe. The two latter are more modern and are probably not prehistoric. The Museum of Science and Art at Dublin possesses several ancient harps, attractive on account of their historic and national interest, but they are not for use.

M. Paul du Chaillu wrote his interesting work, "The Viking Age," to demonstrate the proposition that the early settlers of Britain and the British Isles were Vikings rather than Anglo-Saxons. He based his theory upon the similarity of the many objects found, respectively, in Britain and Denmark. While his theory has not been accepted generally, yet it must be confessed that the similarity he points out was remarkable. Not the least is it so with regard to the trumpets or horns (luhrs). A fact in this similarity opposed to Du Chaillu's theory is that the greater, almost the entire, number of these trumpets are found in Ireland, while they are extremely rare in England.

Diodorus says of the Gauls that they had barbaric trumpets of a special nature which gave a hoarse sound well suited to the din of battle. The use of war trumpets among the Celtic population of Western Europe has been more than once mentioned by classic writers, and passages from them have been cited by Sir John Evans, Sir Augustus W. Franks and others.

The only mention by Dennis of music or musical instruments as having been found in Etruria is that of "a singular spear or rod with a number of movable disks which might have been rattled together so as to keep time, and which, as it was found in connection with armor and weapons, seems to mark it for military use and may have served as an accompaniment to a band. A similar instrument was found in the neighborhood which had on its top the figure of a naked man dancing." This is the tintinn abulum.

The United States National Museum possesses a large, interesting and valuable collection of musical instruments, which have been obtained primarily through the interest of the late Dr. G. Brown Goode, the Assistant Secretary of the Smithsonian Institution, in charge of the National Museum. Very many of these are extremely primitive and might well have served in prehistoric times. Their use by savages and primitive peoples in the earliest stages of their history shows an almost certain connection with prehistoric times. It has, therefore, been considered proper that they should have been noticed among prehistoric instruments.

The museum has also published various memoirs and ethnological papers, reports of travels, descriptions and catalogues of collections, wherein savage and primitive musical instruments have been figured. It is deemed wise to employ this material so far as it relates to or will elucidate the subject in hand so that it may be brought together, and, so far as possible, a view of prehistoric musical instruments, especially those in the United States National Museum, presented.*

Prominent among the prehistoric instruments of the United States from which sounds or notes can be obtained, are the bone whistles from ancient graves of the coast of California. East of the Mississippi Valley, with a few exceptions, there appears to be an almost entire absence of musical instruments. The whistles made from the limonite concretions and the stone tubes or trumpets (?) represent all that can be so classed.

The ancient instruments from Mexico, Central and South America form a most interesting series and show in some degree that music occupied a prominent place in the arts. This is naturally to be expected of a people or peoples with arts so highly developed in other directions—architecture, sculpture, etc. Drums, rattles, horns and trumpets are mentioned by the early Spanish writers in connection with war, religious ceremonies, and festivals of various kinds. The whistles or flageolets of pottery form the largest group in the museum collection and have been deemed worthy of considerable attention. The whistling mechanism in all is identical with that of the modern flageolet, and they have a compass of from two to seven or more notes, according to the number of finger holes and their relative sizes. The smaller instruments are mostly caricatures of the human face or figure, or of animals or birds. The larger instruments are like the modern flageolet in form.

The most important group, in point of numbers, of prehistoric musical instruments, is from Chiriqui. It embraces drums, rattles and whistles of pottery and a number of bronze bells.

The musical instruments in the U. S. National Museum obtained from Guiana can not properly be classed as prehistoric. It was thought, however, that descriptions of a few primitive instruments belonging to still existing tribes might prove interesting. It appears that only a limited variety of instruments are known to these people. Rattles made of gourds and plaited strips of cane, and whistles or flutes of bone and different material seem to have been all that can be so classed.

The "whistling bottles" from ancient burial places in Peru are also described. These may not have been musical instruments, but they are capable of producing musical sounds or notes, and it was thought best to insert them.

Different opinions exist among historians of music as to the scale adopted by primitive peoples in their earliest efforts. One class thinks it finds in the laws of sound a relationship between notes of different pitch, which harmonize with each other and make a concord of sweet sounds, and demonstrates a scale natural to all men and therefore universal, applying as well to the savage as to the enlightened; that is to say, they believe that when the savage has become sufficiently practiced in music to employ a scale of any kind, he will use that belonging to

* To this end instruments of wind and percussion from Palestine and Syria, India, Tibet, Egypt (Thebes and Cairo), from various native tribes of Africa and the islands of the South Pacific ocean, from the Alaskan and Hudson Bay Eskimo and the Indians of the northwest coast of America, are introduced for comparison with known prehistoric examples.

modern and civilized music because that scale is natural to man. Other persons deny this, and express their belief that primitive peoples either did not recognize this concord, or else did not desire it.

These differences of opinion have not been adjusted. When one party shows primitive instruments on which the modern scale can be produced, or shows primitive music written on the modern staff, they are met with the assertion that this is, or may be, the result of straining the instrument to produce the given note.

The authors have taken no side in this controversy, recognizing their role to be that of gathering facts rather than indulging in speculation; that their facts may be used by both parties; thus serving in some degree to elucidate these disputed questions.

Great care has been employed in ascertaining the tones or pitch indicated in the staves, that they should represent the normal scale of each instrument. They could be manipulated so as to give a tone higher or lower than normal. Particular pains have been taken to represent upon the staff the notes obtained by using average force in blowing, and to avoid the pale of temptation to raise or lower the pitch in order that the intervals might be more easily represented on the staff or more satisfying to the ear.

The fact that it is rare to find two instruments from a given locality which produce the same tones indicates at least that their construction (musically) was not based on any established or recognized scale. With most of them the intervals and scale appear to have been purely accidental. What results might be obtained if all the prehistoric musical instruments could be brought together and studied it is impossible to say.

CORRESPONDENCE.

Editor of The Archaeologist:

From my examinations of several ancient shell-heaps on the islands of the San Juan archipelago, I am led to believe that the aboriginal inhabitants of these islands discarded the use of stone in the manufacture of their implements and used bone instead, with the exception of the celt, which they clung to long after the whites came among them, and which they used for the purpose of digging out the charred coal when burning out their canoes, a bone being attached to the celt for a handle.

On the western shore of Wescott bay several shell-heaps were removed for the purpose of tilling the land on which they rested, and using the shells for building a road-bed. In the removal of these masses of shells several stone celts, with bone attachments; three bone knives and two bone spears were discovered; but nothing in the shape of stone implements, except the celts, were found.

On hearing of this find I examined the articles and then made a thorough investigation of the locality, but could find nothing indicating either stone or bone work. A mile to the eastward, however, and on the opposite side of this same bay, were found the indications of a large ancient village site, and very ancient shell-heaps stretched along the shore line. In places, in time of storms, at high-tide the water had cut into these shell-heaps and their contents had fallen on the beach below, where I found several stone celts and quite a number of stone arrow and spearheads; but no bone implements.

These bone spears are made of the ribs of the deer, one end being ground, or cut, down to a sharp point and four or five deep notches cut along one side, barb-shaped. The whole rib was used, and when thus fashioned and attached to a suitable shaft and launched as an arrow or spear, must have been a formidable and dangerous weapon.

During the last fall, in company with another gentleman, I examined a shell-heap on Lopez island that had recently been plowed down and converted into a potato patch. In the course of half an hour we picked up several bone celts, two bone spears and one bone knife; but our further search was unrewarded by finding anything in the shape of a stone implement. These celts were made of the bones of the elk, or some other large animal, larger than the deer. They were ground, or cut, to an edge, some being beveled on both sides and some of them beveled only on one side, and all of them were more or less decayed. The spears were of the same pattern as those above mentioned. One of them was very rudely executed, the tool used in its manufacture being evidently a sharp stone.

The notches being roughly cut, the point was rough, but quite sharp, and the end intended for the shaft was broken off and untrimmed, although it was just as it came from the hand of the manufacturer. The other spear point was presumably made with steel tools; the work was neatly executed, the notches were smoothly cut, the point sharp and polished and the end to be fitted on the shaft was cut down flat and thin. The spear ma ie with the sharp implement appeared of a much later date than the other one, or had been better protected from the elements.

An old Indian woman lives in this town who was born and raised upon the beach and lived among the wild Indians until the whites came, when she was selected by one and taken as his wife. She is very intelligent and speaks English well. This woman called at my house a short time ago, when I took the opportunity to show her some stone arrow points. She said she knew nothing about them; that her people used bows and arrows until the whites came, but their arrows were made of hard wood seasoned in the fire and sharpened.

I then showed her a bone spear point—one of the above described. The effect was curious and instantaneous. She gave a sudden start, almost bounding from her chair; her dark eyes flashed and her cheeks grew a shade duskier. Snatching the weapon from my hand, she made a motion as if throwing a spear, and then laughed outright. It evidently recalled to her mind the days of the chase and potlatch. She said her people had such spears when she was a girl, and used them for spearing fish and killing deer.

The bone weapons that I have seen are far superior to those made of stone, being better adapted for penetrating and less liable to break. They could also be manufactured with much less labor and skill.

While I have no doubt that the stone age overlapped that of bone, and in some places perhaps the implements may be found together, I believe there was a distinctive bone age in this region.

W. H. THACKER.

Friday Harbor, Washington.

Editor of The Archaeologist:

I am deeply interested in your crusade against the modern manufacturer of spurious flints, and intend to do my part of the work in exposing all such rascals that come to my knowledge.

As I write, I have before me some of the curious forms pictured by Professor Wilson in the November number of your valuable magazine. There have been, possibly, sixty of these spurious flints sent me that are undoubtedly the work of the same person or persons engaged in this nefarious business. Very fortunately for me, I have not been duped to the extent of a "sou," as these frauds were sent me on approval and there will be that many less spurious flints on the market, as I intend to hold on to them and keep them from reappearing and catching some unsuspecting eager collector. The party from whom I received these frauds is a printer in Koch, Ohio, and claims he received them as pay for printing done for some of these unscrupulous rascals. Unfortunately, I did not obtain their names.

I have received some fine genuine relics from this party, and I am of the opinion he has been innocently duped through his inexperience.

This same party sent me a stone pipe supposed to have come from eastern Virginia. The pipe was pecked all over; drilling of bowl and stem seemed to be all right, but as soon as the outer surface was exposed to the flame of an alcohol lamp, an immediate change took place; the odor of sealing wax could easily be detected, and I found the entire surface had been smeared in this way and then covered with a yellow sand. In company with this specimen I received a pipe, termed the "babboon pipe," made of steatite. This specimen baffles me, as well as it does a professor who is supposed to be 'way up in antiquities.

Now, what I would like to do is to forward this pipe, with a number of the spurious flints, to someone you would designate, who would render a decision respecting their genuineness, as I am convinced a great many are frauds. There are a few that I am in doubt about, and would like to have the benefit of their experience.

Kindly let me hear from you as early as possible, and oblige.

Fort Wayne, Ind.

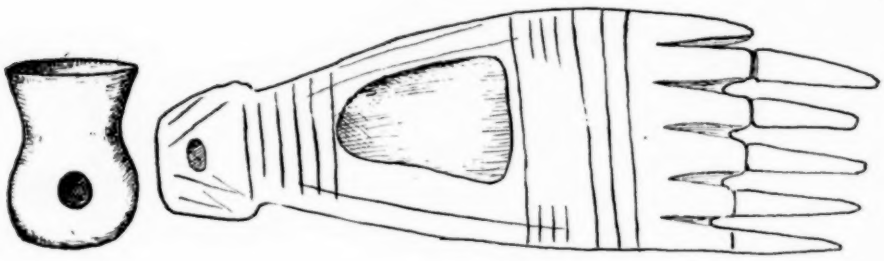
CHAS. P. CHERRY.

[We would advise you to obtain the expert opinion on your relics of Professor Thomas Wilson, LL. D., Curator of Prehistoric Archaeology, U. S. National Museum, Washington City, D. C.—Editor.]

Editor of American Archaeologist:

Seeing only several references to Canadian relics in the late numbers of The American Archaeologist, and knowing that we get abundance of relics showing good workmanship and artistic design, though generally of different types than relics from the mound, etc., I propose to start the ball a-rollin' by giving a description of two which came to my hands lately:

No. 1 is the smallest specimen of the vase type of stone pipe from this section. It is of steatite, a mottled, dark gray in color, highly polished and in perfect condition. This is the general type of stone pipe here; but any sort of stone pipes are rare. Their place in the luxuries of the aboriginal hereabouts being taken by clay pipes of the Huron Iroquois styles. These vase pipes vary somewhat in detail; some have spare mouths and others oval transverse sections, while others have two stem-holes on the opposite sides of the bowls. Dimensions of pipe No. 1: 1 1-8 inches in height, diameter of mouth, seven-eighths of an inch; shortest diameter of bowl through the stem-hole, thirteen-sixteenths of an inch; the opposite diameter, seven-eighths of an inch; diameter of the stem-hole, one-fourth of an inch; diameter of the neck, three-fifths of an inch; walls of the pipe are very thin, one-eighth of an inch in thickness. The bottom is rounded, but flat enough for the pipe to stand on it without support, and lacking the two little holes bored in at an angle for attachment purposes generally noticed in pipes of this class.



The other relic is a horn comb, small-sized and carved in shape of a right hand, or paw, having five fingers of about equal length and a rudimentary thumb. The knuckles on the fingers are determined by incised cross lines above and below, and in several cases by complete incised rings around the fingers. One of the fingers shows a talon, or nail, at the end; the other two finger-tips are broken off and the remaining two are just pointed. The back of the hand corresponds with the outside of the horn, and has three parallel transverse lines below the fingers, then some short lines, or incisions, on each side. Then a large triangular hole is cut through where it tapers to the wrist. Below this hole a half dozen more parallel transverse lines appear. Then the wrist widens abruptly for the space of half an inch or more, having diagonal lines on it. It is in length four inches, and in greatest breadth one and three-eighths inches, with average thickness of three-sixteenths. The length of its fingers is one and one-fourth inches, and these are not separated below the middle joint. The back and front incisions made to form the fingers are not meeting.

This comb was much used, as some of the above lines are nearly worn out. It is of very neat workmanship and will compare favorably with any horn, bone or wooden aboriginal comb in the Ontario Archaeological Museum, in which, together with the pipe described, is its ultimate resting place.

Both these relics are from a prolific village site which has not produced as yet any trace of white contact, and must have existed before the advent of the coürier de bois, or French Jesuits, being situated on the height of land separating the waters flowing west to Georgian bay in Lake Huron, from those flowing into the Bay of Quinte of Lake Ontario, forming a route much used from prehistoric times up to the present, Champlain being the first authentic white man to mention it, and having traveled it, in 1615, with a body of Huron warriors advancing to attack the Iroquois in New York state.

G. E. LAIDLAW.

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Laying aside, for the present, the time-worn inquiry into the manner of Man's first appearance in America, let us indulge for a few moments in idle speculation about the manner of his future final disappearance from it.

Only one-fourth of the earth's surface is dry land; and less than a century ago not the half of that had been explored by civilized people. In the boyhood days of many persons still in the active pursuits of life, the atlas of the world represented the continent of Africa as a great blank in a fringe of seacoast more or less known to adventurous navigators. The interior of Asia was also a blank space marked "unexplored"; as was also the greater part of South America; and, in North America, from Lake Superior to the Sierra Nevada mountains was an open blank designated "The great American desert." Half a century ago nothing at all was known of the interior of New Zealand, New South Wales, Van Dieman's land (as then named on the best maps); or, indeed, of any of the islands of the Pacific and Indian oceans a mile within their shore. And, strange as it may seem, with the remarkable civilizations existing for sixty centuries or more in Asia Minor, and in Egypt on the lower Nile, and, later, at Carthage on the African coast, and in the vast cultured empires of Greece and Rome, just across the Mediterranean sea, the sources of the Nile were utterly unknown, and also remained unknown to enlightened and educated Europe and America until discovered less than forty years ago by Speke and Grant. Since the great African lakes were first seen by Europeans, in 1860, and the course of the Nile traced from them to the sea, almost every nook and corner of the then unexplored world has been ransacked; and experience and observation have demonstrated the fact that every clime and all latitudes, from torrid Congo to frigid Alaska, are adapted to the existence of some variety of the human race. And the time is perhaps not far distant when improved appliances for rapid transit and transportation—by steam, electricity, compressed air, and by Professor Langley's aerial motor—will render the Sahara desert and the Antarctic continent comfortable places for man's residence.

When, therefore, human ingenuity and perfected knowledge of the laws of hygiene, health and subsistence shall have populated the entire earth to its fullest capacity—what then?

In delving down into the earth's strata we turn over the massive stone leaves of the geologic record and read therein, in legible characters, the story of evolution and progress of early marine and terrestrial life. It is a curious and intensely interesting story. A few of the simplest primordial organisms, as the

Pentacrini and other *Radiates,* have persistently survived with but little modification from the dawn of Silurian time to the present day; but as the world forged along through the centuries and ages, in obedience to cosmic laws, its elevations and its configurations of dry land, and its ocean currents and atmospheric temperatures changed about, the law of development produced sucessive races of animals gradually tending to higher and more complex structures. Each principal family—with exceptions noted—have, by certain occult limitations of capacity for further progression, matured and flourished for a time, then declined and finally disappeared, yielding the theatre of their existence to types yet more advanced. Thus, in the close of the tertiary period the earth—this part of it at any rate—was dominated by the Mastodon—and portions of the old world by ancestors of anthropoid apes, perhaps. The elephant family reigned supreme in America before the ice age, from Grinnell land to Patagonia, with neither lion, tiger, rhinoceros or apes to dispute their sway, and their formidable predecessors of earlier times, the Oreodons, Dinosaurs and Brontotheriums having lived out their days, had long ago left the stage. The mighty American pachyderms for a period roamed in unmolested freedom the forests and plains of this hemisphere—and of the Eastern also—but at last succumbed, by force of the inevitable law of limitation, and became extinct. What special or immediate operation of that law caused their total extinction? Not the sudden change of climate, for the slowly advancing ice sheets would have only gradually forced them from their inhospitable habitats, north and south, to the genial warmth of the tropics. Not the sudden failure of food, for they were practically omnivorous, and some parts of the earth yielded at all times abundance for their support. Nor was it caused by the ravages of enemies, for none were here able to cope with them. We know not the effective cause of their annihilation; certain it is, however, they had fulfilled their mission, passed away and were succeeded by a superior animal, savage Man, who closely followed them upon the scene they vacated.

Man the animal, the highest yet known, but nevertheless an animal, now controls the earth. Like the Mastodon, he is a cosmopolitan. In the fullness of time he will possess the earth, every foot of it. What then? Will he, too, act out his allotted part, make his exit and be replaced by an animal as far his superior as the troglodyte exceeded the Mammoth? And will that higher lord of the earth, in the far distant future, pry into the Quinternary formation, and finding the fossil remains of extinct Man, marvel as to the manner of creature he was, and wonder how he came here, and what sort of catacylsm it was that wiped him off the land?

BOOK REVIEWS.

Earthenware of the New York Aborigines. Prepared by W. M. Beauchamp, S. T. D., Albany, N. Y., State University. 1898.

This bulletin, marked No. 22 of Vol. 5, is the third of the special series relating to prehistoric archaeology of the State of New York; made available by a recent legislative appropriation for the natural history department of the state. As were the two first of this series—that on Chipped Flint objects, and on Polished Stone Implements—this one has also been prepared by the well-known archaeologist, Rev. W. M. Beauchamp, uniformly with the others; exhaustive in description and arrangement, and illustrated with 245 cuts from accurate drawings by the author of typical specimens selected from a great number in the State Museum and many private collections throughout the state. The figures represent every form of pottery vessels with varried styles of decoration, and many

ornaments, amulets, etc., of burnt clay; and a surprising array of clay tobacco pipes of all patterns from the plain to the highly ornate and grotesque. The author says: "As a rule, vessels of stone or of bark preceded earthenware in New York, the latter being in general use only in recent times. Those of bark have left no trace, but we may sometimes infer their use on sites where nothing else is to be found. Potstone, or steatite, is not rare in many places, but is usually absent from those where earthenware occurs. The latter was universal among the Iroquois family, and was largely employed by many of the Algonquins." Of the pipes he remarks: "The Iroquois did not make stone pipes when first known, unless rarely, the clay pipe being then in use throughout the various nations of that large family; but for official purposes stone calumets appear quite early. Captain George Weymouth, who visited Long Island in 1605, said: 'The heads of their tobacco pipes were sometimes made of clay, and sometimes were only the claw of a lobster; but they were all sufficient to hold as much as ten or twelve of ours.'" The author adds, "Chronologically most of the articles here described belong to the seventeenth century, and the larger part of the rest apparently to the sixteenth," thus ascribing to the Indian pottery of New York no very high antiquity.

The continuation of this admirable series of archaeological bulletins will depend upon the enlightened spirit of the legislature in appropriating funds for defraying its cost. This will, no doubt, be done; and it has been decided by the regents of the State University having control of this work to publish in the next bulletin an archaeological map of the state, for which Mr. Beauchamp has already collected a large amount of material.

The people of the Empire State are to be congratulated upon having legislators who can rise above party schemes and individual jobs and enact measures to encourage and foster the interests of science. And they are also to be congratulated upon having managers of their State University of such discernment and wisdom as to place the archaeological survey of their state in charge of one so eminently competent for the work as is Rev. W. M. Beauchamp.

Ohio Archaeological and Historical Quarterly. Vol. II, No. 1. Columbus, Ohio. 1898.

Ohio has a history, both written and unwritten, paralleled by that of only a few of the other states of the Union. It was for centuries before its discovery by Europeans the abiding place of the most advanced tribes of aborigines in the Mississippi Valley; and from early colonial times was the theatre of many of the most thrilling events in the fierce conflicts for supremacy between the native owners of the soil and the white invaders. For its long list of statesmen, patriots, scholars and scientists it is justly distinguished. Its Historical and Archaeological Society therefore has a rich field, prolific in varied material, for its work, and some of the brightest men of the state have devoted their lives to this service. The labors of the future historians and archaeologists of the United States would be greatly facilitated if each state was so fortunate as to have among its citizens so many enthusiastically interested in these studies as Ohio has, and such an efficient association of brainy men as is the Ohio Historical and Archaeological Society. Of the several publications of this society the one now before us—an illustrated pamphlet of 200 pages—was written by the well-known scientist and writer, Professor Warren K. Moorehead. The first part of this number of the Quarterly is a historical compendium of the Indian tribes of Ohio; their relations to each other, and their intercourse and struggles with the whites from 1687 to 1840. The warfare of the two races within the limits of Ohio, from the earliest times up to 1825, Professor Moorehead says, cost the lives of 12,002 white people

and 7,837 Indians. He pays just tributes of praise to the exceptional native ability and lofty patriotism of such chiefs as Pontiac, Logan and Tecumseh, and says of the latter: "Our poor natives, lacking as they did the advantages possessed by even the primitive settler and pioneers, have left a record in war and in statescraft of which a more powerful nation might well be proud. Perhaps history might be challenged to produce a character, elevated from more than obscurity—from real savagery—who is the equal of that magnificent man, Tecumseh. And with Tecumseh died all that was best of the race of Ohio Indians. Truly his sun set in a blaze of glory!"

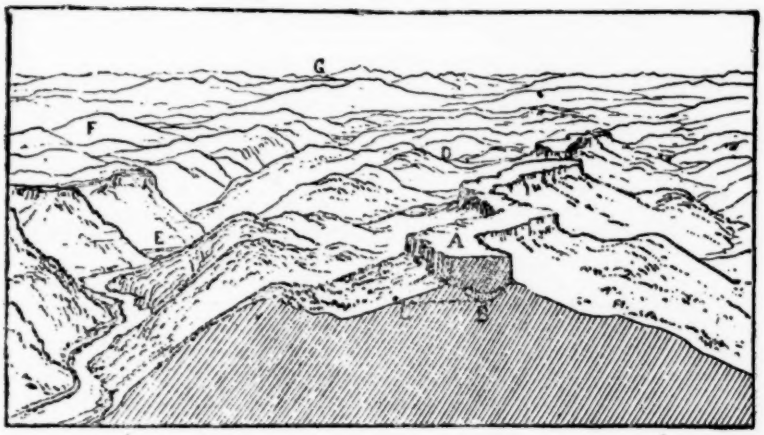
Part Second of the Quarterly comprises the report of field work among the mounds and ancient village sites by the society's agents, under the direction of Professor Moorehead, during the year 1897. In the course of that season many mounds, village sites, graves, etc., were explored, which yielded, in the aggregate, a large number of relics, including some of more than ordinary interest, greatly enriching the archaeological collections of the state museum.

To this valuable report is added an account of the progress so far accomplished in compiling the archaeological map of the state, a stupendous undertaking, originated by Professor Moorehead. The number of prehistoric works surveyed and noted is given by townships in eighty-six counties, amounting to 8230. Among the conclusions from this important survey—not yet nearly completed—Professor Moorehead says: "Glacial kame burials are found to be exceedingly numerous, * * * * being of an earlier or more primitive type than the mounds and enclosures or village sites. The map also emphasizes this fact: that culture was local and no 'high civilization of the Mound Builders' can be assigned. We must account for the presence of many tribes of varying degrees of intelligence, none of them above middle or upper barbarism and many of them being in upper savagery. It indicates a long mound-building period by a fairly limited population rather than an occupation of the entire area by large numbers of people for a short time."

For its historical and archaeological worth, and for its arrangement, style, illustrations and press work, this number of the Quarterly is highly creditable to the Historical Society of Ohio, as well as to its author.

The Macalister Monthly for November last, published under the auspices of Macalister College, St. Paul, Minn., contains a paper by Professor T. H. Lewis on "Sculptures in Carver's Cave," written in the professor's usual clear and expressive style and illustrated from drawings made by him on the spot. Carver's Cave was a short distance below the city of St. Paul in the high outcrops of St. Peter's sandstone forming there the river bluffs; but it has been completely demolished by blasting and quarrying for constructing the trackways of the C., B. & N. railroad. The sculptures were representations of rattlesnakes from three to five feet in length, and of bears and nondescript animal effigies, cut deep in the walls of the cave by Indians who, in the distant past, utilized the cavern for a council room and perhaps a place of refuge. Much credit is due to Professor Lewis for thus preserving the description of the cave and its curious specimens of Indian art from probable speedy oblivion.

NOTES.



Panorama Showing Lava Cap of Table Mountain (A), and the Gravels of the Buried Eocene River Bench (B).

THE NEWEST FACTS IN REFERENCE TO THE CALAVERAS SKULL.

Among the eminent archaeologists of this country the genuineness of the famous "Calaveras Skull" as the cranium of one of a race of men existing millions of years ago, is again the current subject of doubt and investigation.

In this connection also interrogative inquiry is busy with the alleged evidences of the antiquity of "Auriferous Gravel Man," and the conclusion may soon be formulated by authorities upon the subject that it is all a myth.

New and interesting scientific light is thrown upon the long-disputed points by investigations but just finished by Professor William H. Holmes, the distinguished anthropologist and one of the head curators of the National Museum. Professor Holmes occupies at present an entirely neutral position with regard to the matter, because he has not had time in which to study and consider the mass of data he has secured.

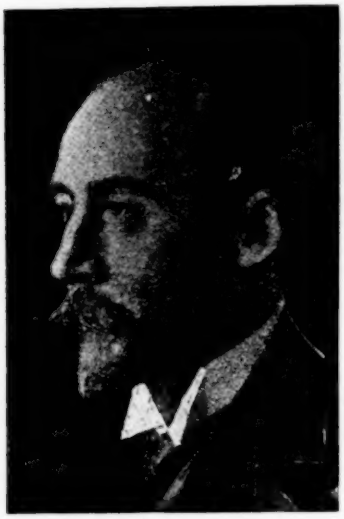
Authorized by Secretary Langley, of the Smithsonian Museum, Professor Holmes went to California in September last to study the problem of human antiquity, which has become somewhat knotty to scientists since the alleged finding of the "Calaveras Skull" and certain fossil remains in Calaveras county, California, by the forty-niners digging in the earth for gold.

Professor Holmes spent nearly two months at the work, and conducted it with all the care and precautions to be expected of him as one of the leading authorities in the domain of archaeology. He returned to the city recently and has furnished The Star the following account of his investigation and apparent conclusions. It makes one of the most important contributions to the literature of anthropology written in recent years, and may possibly lead to a revolution among the theories and beliefs upon the subject. It is:

"For a generation past students of history have been breaking away from traditional notions of the age of the human race in the world. In Europe, it is conceded, there are traces of man in the glacial formations, carrying our history back a hundred thousand years or more, and in eastern North America much evidence has been adduced tending to show that this continent was occupied at least at the close of the glacial period, from ten to twenty thousand years ago. California has, however, put forth claims to still greater antiquity, and, as if determined to outdo the world in this, as in other things, claims to be the cradle of the race, par excellence. She is not satisfied with the 5,000 years of the orthodox chronology, the twenty thousand claimed for the Trenton man, nor yet the 100,000 or more conceded to the paleolithic man of England and the continent of Europe, but sets her figures for the homo sapiens of the high Sierra back so far that seven figures are necessary to express the time if years instead of ages are to be the unit.

"The story of the discoveries that lead to these astonishing conclusions is fascinating indeed, and the manner in which geology furnishes the chronological key must elicit the admiration even of the unscientific reader.

"Soon after the hardihood of the forty-niners began to open up the great gold belt of the Sierra Nevada, there filtered out into the outer world rumors of strange finds in the gravel beds from which the gold was washed. Reports of the discovery of fossil mam-



mals, the mastodon, the rhinoceros, the horse, the camel and many other forms, and fossil plants, including petrified trees, and, finally, traces of man and his arts, were reported. The best known and most widely heralded find was that of a human cranium known as the Calaveras skull, brought up from the depths of a mining shaft on Bald mountain, near Angel's camp, Calaveras county. Other discoveries followed and included implements, utensils and ornaments of stone, the mortar and pestal occuring most frequently. Many of these objects came from the region of the Tuolumne Table mountain, and were reported to have been brought out by the miners from deep shafts beneath the lava beds that cap the mountain. There was, as a matter of course, little appreciation of the character and significance of these finds, for the men in that day were devoted, soul and body, to the search for gold; but the occurrence of human remains under the flows of lava from volcanoes long since extinct was curious enough to excite some interest; and even then there were sceptics who said it could not be. The discoveries that followed are most humorously aluded to by Bret Harte, who, in 'The Society Upon the Stanislaus,' makes the Truthful James 'tell in simple language what I know about the row that broke up our society upon the Stanislaus.'

"These finds took on a more serious phase, when about 1860 Professor J. D. Whitney, director of the State Survey of California, took up the work of assembling and interpreting the evidence and Mr. C. D. Voy brought together a collection of the relics in San Francisco. The finds had been made by miners and mine superintendents, and Whitney visited these people, heard their stories and secured more or less valuable affidavits. He was convinced that the discoveries were genuine, and believed the evidence sufficient to establish the existence of a pliocene race in California. A long report was made, embodying the evidence and promulgating his beliefs. He was followed by others, and there was a pretty general acceptance of his conclusions among students of anthropology and scholars generally.

"But recent investigations have tended to increase, rather than to diminish, the age assigned to the gold-bearing formations. Their age has been made out in great detail by the able geologists of the United States Geological Survey, and the period of gravel depositions is shown to be a prolonged one, beginning far back in middle tertiary time and extending forward to the close of that vast period. Whitney believed all to be late tertiary or early post-tertiary, while many others have preferred to believe them of glacial age, and following the suggestions of their own beliefs and desires in the matter of human antiquity, have thought of the glacial age in the Sierras as probably later than that of the eastern side of the continent, thus bringing the geological chronology of man down toward that of the biblical chronology.

"Now, however, these delusions are finally dispelled by the researches of Lindgren, Turner and others, who tell us that the auriferous gravel man of California, if he really existed, was vastly older than even Whitney was willing to admit. The interest of the problem is thus greatly enhanced, and there is a very general desire to have the whole question thoroughly aired.

"Independently of the question of human origin and development thus associated with the history of the Sierra Nevada, there is not a more fascinating chapter in the whole history of world-building than that furnished by the orographic transformations now so closely made out by our geologists. The story may be told in a few words, and so simply as to convey an understanding of the methods of determining age and a realization of the vast time involved.

"The richest finds of gold made by the forty-niners were in the great valleys that cut their way down through mountains, plateaus and foot-hills from the high ranges to the Sacramento valley. The gravel of the present river beds yielded much of the precious metal, but the richer deposits were in beds of gravel that outcropped in the sides of the

valleys from one to two thousand feet above the river beds. These bodies of gravel were found to extend in attenuated bands far into the mountains, and the rocky slopes were pierced by a thousand tunnels. The summits of the wildest mountains were honeycombed in the eager search for other leads.

"When the geologists finally appeared upon the scene the strange fact was developed that these deposits of gravels were of river formation, and that they really represented fossil rivers, the grandfathers and great-grandfathers of the present rivers, which, in early tertiary times, had been clogged with gold-bearing gravel and then filled to the brim with volcanic materials. Lindgren and Turner have studied these remnants of past river systems, and have determined the course, declivity and age of the streams, and the miners have, in several cases, followed the sinuous courses of the channels entirely through the ranges, washing out the gold and leaving the gravel still in the tunneled channels, as a wood-worm pierces the oak, leaving only slight traces of his wonderful accomplishment. But what a remarkable succession of events this implies; what a vast time is involved, and what an age is given to the races that pounded seeds or acorns in their mortars along the banks of those far-away ancestors of our modern rivers.

"The story they tell is about as follows: The tertiary rivers ran out across the high land pretty much as the streams of today find their way to the sea. They had strong currents and scored down their slaty or granite walls and the gold-bearing quartz seams intersecting them, and filled their beds with the debris. The freed gold sank to the bottoms and the coarse water-worn materials accumulated to the thickness of hundreds of feet.

"It is upon the banks of these rivers that the race must have lived that left its bones and its tools and utensils imbedded along with the bodies of the giant mammals of their time. Then came a change over these scenes—a profound and wonderful change; a period of great volcanic activity followed, and lavas flowed and streams of mud descended until the valleys were filled up and new channels, system after system, were formed. At the close of a vast period of these activities the deepest valleys were filled up to overflowing, and when the flows of basalt, the final products, ceased, the waters of the Sierra had to begin anew the cutting of thoroughfares to the Pacific. This volcanic period continued through a large part of the tertiary age—a period not to be estimated in thousands, but in hundreds of thousands of years.

"But behold the changes that have since taken place! These streams—the Marced, the Tuolumne, the Stanislaus, the American river, the Yuba, and others—have cut their way by the slow processes of erosion down deep into the bowels of the earth, and now run their courses in valleys 2,000 feet deep and many miles in width, so profound, precipitous and inaccessible that it is a day's journey to cross them, where indeed they can be crossed at all by human feet.

"The traveler who descends into one of these great canons and painfully works his way up the opposite side to the crests, where the miners are tunneling the river beds of former periods, finds himself soliloquizing in the following vein: 'Is it possible that man can have dwelt in this wild land so long as this, while these mountains were carved out and the vast valleys formed by the tedious sculpture of the mountain streams? It, indeed, surpasses belief, and unless the most weighty evidence is forthcoming, the whole story of auriferous gravel man must fall.'

"But this is not all the geologist has to tell of the flight of time. When the valleys had been deepened nearly to their present beds the glacial period came on, and the ice reshaped them and modeled the marvelous contours of which Yosemite is a fine type. From the point of view of the man of the old river systems, the glacial period is recent time, but this is the period of the paleolithic man of New Jersey and Ohio, if such there was, and the glacial man of Europe had not, even at this late date, reached the status of culture attained by his California precursor a million years before, if such a precursor there ever was.

"This panoramic sketch is not well calculated to give an idea of the magnitude of the geographical features with which we have to deal, but it may serve to show something of the geological relations. Table mountain A is a long narrow table land extending outward toward the west between two valleys from 1,500 to 2,000 feet deep. The summit of the mountain is sinuous as a serpent, for it is the stream of lava that flowed into the bed of the ancient river whose gravely, gold-bearing bed is seen in the section at B. The streams cut their channels at the sides because the lava was harder than the neighboring formations, and what was originally the valley is now the mountain crest. The dotted lines in the section show how the tunnels pierce the sides of the mountain and reach the main channel of the old stream in the heart of the mountain, and it is from these deep diggings under Table mountain that many of the human relics are said to have been brought forth. At C we have the undisturbed formations of the mountain. At B is Tuttletown, where still lives 'Truthful James.' To the left is the profound Valley of the Stanislaus, and beyond this, and twenty miles away, at C, is Bald mountain, where, in a deep tunnel in formations corresponding to those of Table mountain, the Calaveras skull was found.

"Stranger than all are some of the facts encountered when we come to consider the physical characteristics and culture of auriferous gravel man. The human creature of a period so remote might be expected to betray some characteristics suggestive of his connection with the lower forms, for the race of mammals was then young, but the Calaveras skull, about which such a marvelous chapter in history has been constructed, belonged to a man quite equal to the average man of today in craniological development, and the evolutionist, if we accept the antiquity of the specimen, must receive a shock from this fact quite as stunning as does the ordinary descendant of Adam and Eve. Perhaps, as Bret Harte, in addressing this skull, forcibly suggests:

" 'The professor slightly antedated by some thousand years thy advent on this planet, giving thee an air that's somewhat better fitted for cold-blooded creatures.'

"Perhaps the most striking feature of this strange story of early tertiary humanity is that the traces of his activities, so plentifully brought to light, indicate not that he was struggling with the beginnings of the most elementary arts, as we might reasonably expect, but that he had reached the ripe state of culture known as neolithic, and ground his acorns in well-rounded and neatly-decorated stone mortars, with symmetric, artistically-shaped pestles, shaped fine obsidian blades for use in the chase, decorated his person with well-wrought beads and employed fancifully-shaped stones of various kinds in his arts or ceremonies. Along with these things went, no doubt, the appropriate accompaniments of advanced society, institutions and customs, and when we come to compare these varied objects with the tools and utensils of the tribes of men now living in California, we are forcibly struck with the resemblances, and, indeed, in many cases with the absolute identity of the forms. This again caused the cautious investigator to pause and ask, 'Is it not possible that some mistake has been made and that auriferous gravel man is a myth?' But we turn to the evidence, to the writings of Whitney, Becker and others and to the statements of many miners and mining people, and are compelled to acknowledge its force.

"Mr. Thomas Matteson found the Calaveras skull in his shaft on Bald mountain at the depth of 125 feet, and the following affidavit is furnished by Professor Whitney, who took the trouble to visit the mine and secure it:

" 'San Andreas, Calaveras County, Cal., January 3, 1874.

" 'This is to certify that I, the undersigned, did, about the year 1858, dig out of some mining claims known as the Stanislaus Company, situated in Table mountain, Tuolumne county, opposite O'Byrn's Ferry, on the Stanislaus river, a stone hatchet, similar in shape to this (here is inscribed a rough drawing of a cutting implement of a triangular shape), with a hole through it for a handle, near the middle. Its size was four inches across the edge, and length about six inches. It had evidently been made by human hands. The above relic was found from sixty to seventy-five feet from the surface gravel, under the basalt and about 300 feet in from the mouth of the tunnel. There were also some stone mortars found at about the same time and place and at various times where there were also found numerous fossil bones of different animals, and fossil wood.

" '(Signed) JOHN CAROM.

" 'Subscribed and sworn to before me. WM. O. SWANSON,

" 'Justice of Peace, Calaveras County, Cal.'

"And, again, there is the sworn statement of Mr. J. H. Neale, of Sonora, given by Dr. Becker:

" 'Sonora, August 2, 1890.

" 'In 1877 Mr. J. H. Neale was superintendent of the Montezuma Tunnel Company and ran the Montezuma tunnel into the gravel underlying the lava of Table mountain, Tuolumne county. The mouth of the tunnel is near the road which leads in a southerly direction from Rawhide Camp, and about three miles from that place. The mouth is approximately 1,200 feet from the present edge of the solid lava cap of the mountain. The course of the tunnel is a little north of east.

"'At a distance of 1,400 and 1,500 feet from the mouth of the tunnel, or of between 200 and 300 feet beyond the edge of the solid lava, Mr. Neale saw several spearheads, of some dark rock and nearly one foot in length. On exploring further, he himself found a small mortar three or four inches in diameter and of irregular shape. This was discovered within a foot or two of spearheads. He then found a large, well-formed pestle, now the property of Dr. R. L. Bromley, and near by a large and very irregular mortar, also at present the property of Dr. Bromley.

"'All of these relics were found the same afternoon, and were within a few feet of one another and close to the bed rock, perhaps within one foot of it.

"'Mr. Neale declares it utterly impossible that these relics can have reached the position in which they were found excepting at the time the gravel was deposited and before the lava cap formed. There was not the slightest trace of any disturbance of the mass, of any natural fissure into it by which access could have been obtained, either there or in the neighborhood.

"'And Mr. J. H. Neale declares upon his oath that the foregoing statement is in every respect true. (Signed) JOHN H. NEALE.

"'Subscribed and sworn to before me this second day of August, 1890.
"' (Signed) EDWIN A. ROGERS, Notary Public.'

"And still more authoritative than these is the find by Mr. Clarence King of a pestle, well-shaped, though fragmental, in the old gravels underlying the lava cap of Table mountain.

"When we consider the amount of this evidence and the apparent association of the remains and relics with the remains of extinct animals, and supplement these statements by the statements that such men as Whitney, King and Becker consider the accumulated data sufficient to satisfy them, all must allow that there is evidence, and evidence, too worthy of serious consideration.

"A visit to the auriferous region has a fascinating interest to the geologist and student of human history. The ground is made classic in science and in song, and the story of the gold hunters, and especially the gold finders, of '49 is unequaled in the realms of romance. But a look into the deserted shafts of Table mountain and a visit to the few surviving members of the Society on the Stanislaus, afford little aid to the student, for the observations, preserved in tradition and recorded in books, cannot be made over again. But it is a great satisfaction to read the geologic story on the spot and a pleasure indeed to interview the sturdy men whose lives span the whole recorded history of the golden age of California.

"Angel's Camp, which was the site of the first discovery of auriferous man, is still a typical mining town, and here, and at Murphy's, near by, are to be found a score or more of sturdy forty-niners who have vivid recollections of the early days, and take great pleasure in recounting the events of that eventful time. Many have a more or less definite knowledge of the finding of the Calaveras skull, some from actual knowledge of the circumstances, some from hearsay, and it is a noteworthy fact that nearly all of them agree that the story of the finding of the skull is a 'fake.'

"One of these men, now occupying a position of honor in the community, laughed heartily when the subject of the ancient skull was referred to. 'I was in Angel's at the time,' said he, in substance, 'and can tell you all about it. The boys of those days were given to an inordinate love for "joshing," and, under the leadership of J. C. Scribiner, many practical jokes were perpetrated. Why, I had that skull, with the mate to it, in my store for weeks before the scheme of making sport out of it was thought of. They were brought to me by J. I. Boone from a burial place at Salt Springs, twelve miles west of Angel's. Scribiner got hold of one of these skulls and conceived the notion of "joshing" his friend Mattison, who had a mine on Bald mountain, near by. It was finally planted in the bottom of the mine and duly discovered by Mattison's workmen. Then the conspirators, not getting much satisfaction out of Mattison, carried it to Dr. Jones, at Murphy's, who was the leading physician of the section, and a great collector of curiosities. He took it in, but later, finding cobwebs inside of it, threw it into the street; but, relenting, took it up again and resolved to give it a show; and this was done when Professor Whitney came along. It was shown to him and the story of the finding told him. He took a deep interest in it, as a matter of course, and departed at once to find Mattison, from whom he secured the affidavit as to the circumstances of its discovery. All were delighted to have the joke on Whitney, who, being an easterner of very reserved demeanor, was unpopular with the miners. So the story began, and that is all there is in the business.'

"Other versions were heard and a few individuals were found who doubt the story of deception and say the old men of Angel's are still given to 'joshing.' These stories, however, do not seriously affect the evidence found in Table mountain and elsewhere, but they serve to indicate the difficulties that surround a proper investigation of the subject,

and it is only by a most painstaking gathering and sifting of the various strands of evidence that a solid basis of fact can be reached.

"As the question stands today the very imposing group of facts and observations arrayed to support the theory of great antiquity of man in California is compelled to meet objections so strong that they may not be able to withstand the onslaught of skepticism."—Evening Star, Washington, D. C.

It has been supposed that embalming the dead and converting the bodies into mummies was the earliest and universal mode of disposing of the dead among the ancient Egyptians. This long-accepted theory has been almost conclusively overturned by the recent startling discoveries of Professor Flinders Petrie, who has thrown fresh light on the methods of burial of the ancient Egyptians. During the excavations conducted by him at Deshasheh, about fifty miles south of Cairo, a series of old Mastaba tombs, dating back 3,500 years, were opened. On uncovering the lid of a number of wooden coffins, instead of the usual type of embalmed mummy being revealed, the dissected body of a woman, carefully wrapped in mummy cloth and linen, was disclosed, but the flesh had been entirely removed from the bones, unmistakably before burial. The uncovering of the mutilated flesh-scraped remains at Deshasheh ranks among the most astonishing archaeological discoveries of the age, and goes far toward confirming the theory of cannibalism among the cultured Egyptians.—Walter L. Beasley, in Scientific American.

Egypt contains seventy pyramids erected from the first to the fourteenth dynasty, a period of about 2,500 years—from 5,000 to 2,500 years B. C. It is now a settled fact that the sole object of these great artificial elevations was a tomb for the royal builder, which was only to hold the King. Sometimes the Queen was buried in it. The members of the royal family were buried near its base. It was the discovery of some of these tombs at Dashoor by M. de Morgan (1893-95), that brought to the surface the body of the Princess Khumit and jewelry valued at $600,000.

The most imposing structure of this kind in America is the Pyramid of the Sun, at Teotihuacan, Mexico. It measures at its base 680 feet and is 180 feet high. It is divided —like all large pyramids—into four stories, three of which can still be seen. On its summit stood a temple, having a colossal statue of the Sun, made of one single block of stone, in the breast of which was a hollow, in which was placed a planet of fine gold. This statue was destroyed by Zumarraga, Mexico's first bishop, and the gold seized by the avaricious and murderous Spaniards. Accompanying it is a smaller elevation dedicated to the moon, the original form of which was, when perfect, truncated and rectangular, and measures from east to west 500 feet, and from north to south 450 feet.

PREHISTORIC IRRIGATION IN EGYPT.

While modern English engineers are steadily carrying out a plan for irrigating Egypt that is to restore prosperity to its sun-parched fields, an English antiquarian has found at Hierakonpolis the records of a primitive system of irrigation that was carried out no less than six thousand years ago. The changeless East has rarely vindicated the repetition of its history in such convincing sort. Before the pyramids of Gizeh were planned, or the mighty steps of Sakkara completed, at the very dawn of those earliest dynasties of primeval monarchs who ruled in the hoary dawn of Egypt's history, the limestone macehead of King Nar-Mer recorded the turning of the first sod in some primitive scheme of canalization. Even then four distinct types of population can be traced; and on the pivot of an ancient door is carved the bent figure of a bound captive supporting its weight upon his back, exactly like those Romanesque or early Gothic figures to which Dante compared the suffering souls in his "Inferno." Even so long ago, the vase of sculptured diorite shows a skill in working hard material that would be difficult to surpass today; and the toilet dish from Denderah, dating about 2450 B. C., is as delicate a bit of workmanship in the same stone as could ever be produced. Professor Petrie found an ordinary coat button, too, carved roughly in bone, that opens up quite novel problems of attire before the days of "double-breasted vests." The land of slaves and warriors and priests has always been the same in its essentials. The beauty of its art alone has perished.—St. James' Gazette.

It is the opinion of Professors Petrie and Brugsch that the custom of cannibalism was brought into Egypt by the Libyan invaders, who occupied Upper Egypt about 3300 B. C. They cut up and dismembered the bodies of the dead, eating the flesh as a part of the burial ceremony to increase the eater's own intellectual powers, as well as imbibing all the magical attributes of the victim consumed.

Two international scientific bodies which held their annual meetings a short time ago, discussed subjects of general interest. One, the Cambridge Congress of Zoology, was remarkable for a fascinating paper by Professor Haeckel on "The World's Present Knowledge of the Descent of Man." He did not hesitate to declare that science has now established the absolute certainty that man had descended through various stages of evolution from the lowest form of animal life during a period estimated at a thousand million years.

This knowledge, which must now be accepted as the crowning achievement of science during the nineteenth century, was won through recent discoveries of fossil remains in Java, Madagascar and Australia, and is made still more complete evidence by the available proof of discoveries wherewith Darwin's name is most commonly associated. Professor Haeckel thus summarized the steps of man's evolution:

"The monophyletic origin of all mammalia, from monottremata upwards to man, is no longer a vague hypothesis, but an established fact. All the living and extinct mammalia which we know are descended from a single common ancestral form which lived in the triassic, or the Permian, period, and this form must be derived from some permean or, perhaps, carboniferous reptile, allied to progonousauria and theriodontia, which was derived from a carboniferous amphibian, or group of stegocephala.

"These amphibians, in turn, descend from Devonian fishes, and these again from the lower vertebrates. The most important fact is that man is a primate and that all primates, lemurs, monkeys, anthropoid, apes and man descended from one common stem.

"Looking forward to the twentieth century, I am convinced that it will universally accept our theory of descent. I have no doubt that the strong influence of anthropogeny upon the other branches of science will be most fruitful."

One member said that Professor Haeckel had spoken of a thousand million years as necessary for his evolution tree, while Lord Kelvin supposed himself to have proved that this world, as the scene of life, could not be more than twenty-five million years old. It did not seem wise to complicate Hackel's theory by assuming that a thousand million years were required for the proof.

Hackel replied that the computation was not his own. He took the time from one of the most eminent geologists. For himself, he confessed he had no intuition as to the length of time. The congress received and discussed Haeckel's paper with the greatest enthusiasm.

"The recent astonishing discovery of the tomb of Amenhotep II at Thebes, with the garlanded body of the king lying uninjured in his coffin, furnishes incidentally a rather amusing commentary on the popular theories that have had their day among the dilettanti. The writer has often been approached by people who were certain that Seti II of the nineteenth dynasty was the Pharaoh of the Exodus, because his body had never been found, proving conclusively that he was drowned in the Red Sea! Apart from the fact that the Exodus narrative does not state that the Pharaoh was drowned, and the further fact that many Pharoahs' bodies are missing, the above refreshing hypothesis has received a cruel blow; for in the tomb of Amenhotep II, just discovered, a number of other royal bodies had been deposited for safety, among which is the coffin of Seti II. Of course, the obvious reply is that among the 'Egyptians dead upon the seashore' (Ex. xiv, 30), the body of the drowned Pharaoh was discovered by his servants and given the usual interment at Thebes. Delightful! But how about the disappearance of his body as proof that he was the Pharaoh of the Exodus? It is to be seriously feared that Seti II will be hereafter forced to retire to private life and relinquish all claim to popular attention."—James Henry Breasted, Ph. D., in Self-Culture.

Cannibalism is by no means extinct today; nor do the dark depths of Central Africa alone shelter its devotees. In spite of the colonization of the South Seas by European nations, these islands are still infested with secret anthropophagi. The Pintos, an aboriginal tribe of Yucatan, have repeatedly been detected in cannibal practices; while among the Dyaks of Borneo there are accounts of a recurrence of the outrage after almost every petty feud and raid. In 1873 the Chasseurs d'Afrique captured an old Kabyle on the plateau of Sidi—Belbez (Algiers), who had committed innumerable murders to indulge this disgusting passion, and had twice been caught in the act by his countrymen, who contented themselves with giving him a good hiding the first time, and released him on another occasion when they found his victim had only been a French settler!

In the study of the psychology of cannibalism numerous incentives to the practice are shown. Regardless of the influence of general depravity—which is supposed to exist in the highest degree among cannibal tribes—recent investigations have shown that those who partake of human flesh as food merely because they prefer it to other aliments, is comparatively small. It is, in fact, but little larger than the percentage of those unfortunate beings who, possessed of a natural horror to such food have—in sieges and shipwrecks—been driven by starvation to eat human flesh.

Cannibalism has its horrors, but to those who study closely both cannibalism and cannibals, certain extenuating circumstances arise. Superstition and its progeny must forever be deplored, and debasing passions cannot be countenanced; but, separating these from cannibalism, and considering the mere act itself, we cannot refrain from the suggestion that members of the human family are guilty of even greater sins upon their neighbors. "To cut a man's flesh after he is dead is far less hateful than to oppress him while he lives."

The typical Eskimo lamp is a shallow dish of soapstone with the outline of the gibbous moon. It has hollowed out on the upper surface a reservoir to contain oil. The rear is curved and bounded by a low wall. The reservoir slopes gradually up to the edge upon which the wick is laid. This edge is straight. The wick is of moss, rubbed to powder between the hands, and carefully laid in a thin line along the wick edge of the lamp. The oil in the reservoir stands just at the lower margin of the wick. The flame is about two inches high, and is clear and smokeless if the wick is properly cared for. The oil is supplied by blubber melted by the heat of the lamp. With this contrivance the Eskimo lights and heats his house, cooks his food, and melts snow for his drinking water. The lamp is peculiarly the possession of the women. Each head of a family must have a lamp, though two or more families may live in the same hut. The Eskimos have no phrase expressing a greater degree of misery than "a woman without a lamp." After the death of a woman her lamp is placed upon her grave.

The machete—pronounced "mah-tchay-tay"—with which the Cubans are armed, and which is the implement for all needs throughout Spanish-America, has long been made by the thousand at Hartford, Conn., and sold to all American Spanish-speaking neighbors. This blade is first cousin to the sabre of our cavalry, but while the sabre serves only one purpose, the machete serves many, and is as useful in peace as in war. Almost every Spanish-American male above the age of childhood carries a machete. The laborer has it, because with the machete he cuts sugar cane, prepares firewood and trenches the ground for his crop. The horseman wears the machete, because with it he cuts his way through the woodlands during journeys over rough country. It is sword, spade and hedging bill, axe, hatchet and pruning knife. The hidalgo wears it with silvered hilt and tasselled scabbard; his humbler neighbor is content to carry it bare and hilted with horn, wood or leather. The machete may be had in nearly thirty different forms. The blade, which varies in length from ten to twenty-eight inches, may be either blunt or pointed, curved or straight, broad or narrow. The favorite with the laborer is the machete of medium length, with unornamented handle and broad, straight blade. The Spanish-American hidalgo bears a scabbarded machete, long, straight or curved, as taste prompts.

Chicago has come into the possession within the last few weeks of what promises to be the most valuable collection of ancient writings ever on this side of the Atlantic ocean. Through the efforts of Edgar J. Goodspeed, of the Chicago University, son of the secretary of the institution, it has secured the latest and most promising find of manuscripts made in Egypt in years. In the neighborhood of two or three hundred complete pieces of papyri, in a good state of preservation, are included in the collection, besides hundreds of fragments. This collection of manuscripts, of which such interesting things are expected, was found by an old Arab sheik while digging about in the sands somewhere along the bank of the Nile. It is suposed by the two or three scholars who have already glanced at this collection of papyri that they were found in the neighborhood of what was once the city of Asioot or Asiut. They were written in Greek during or before the time of the Roman occupation of Egypt, and some few of them, partially deciphered, show a date approximating 160 A. D., or during the reign of Emperor Hadrian. But there are many others not yet investigated which are evidently of a much older writing, and give promise of some most interesting results. Among them is a fragment of Homer of great value, and the chances of finding another scrap of the New Testament of a similar nature to that recently discovered in Egypt are thought bright.

The manuscripts are found to be principally commercial documents of Hadrian's time, with a few pieces of a literary nature. In the days in which they were written the Romans farmed out the collection of taxes, intrusting the work to various contractors. The receipts and statements which the latter made in their accountings with the government officials compose the bulk of the smaller fragments. They are interspersed with business letters and memoranda of a commercial nature. Frequently scraps of large manuscripts have been taken and used for hasty figuring and notes of transactions. Several months, possibly years, will be needed to complete the work of translating the whole of the papyri. Each of the larger pieces of papyri will be preserved between sheets of glass, and then carefully translated.

A. F. B.